

## Tropical Areas of Interest Discussion for August 14, 2010

Created 1600 UTC August 14, 2010

GRIP Forecast Team: Cerese English, Jon Zawislak, Matt Janiga, and Andrew Martin

**Summary:** The DC-8 is on the ground in Fort Lauderdale and it is currently a no-fly day. The Atlantic, Gulf and Caribbean continue to be devoid of potential targets, and the GRIP team is focusing on the possible re-development of ex-TD05 two days out, as this system has remained along the Gulf coast, has persistent convection, and the global model forecast consensus is for it to track back out over the Gulf of Mexico in 48 hours. The tropical waves and associated pouches throughout the Caribbean and Atlantic are not producing significant convection, have little organization and no development of any other targets is expected in the next 48 hours. Since the DC-8 has instrumentation that needs work, this lack of targets situation is somewhat fortuitous, since the first day of flight operations could have begun as early as tomorrow. As a cold front dives south off of the US east coast, chances for afternoon showers and thunderstorms at FLL will increase throughout the weekend.

### **Forecast for 1600 UTC 8/14/2010:**

#### **Overview:**

Although the overall Atlantic Basin is quiet in terms of TC activity as of late, there are a few interesting features to discuss (**1, 3**). The ITCZ extends quite zonally along 10N across the Atlantic and East Pacific. Other than the convection associated with that, there is only isolated convection associated with a few tropical waves, and a strong baroclinic frontal region diving south between the coast of South Carolina to 30N/70W and curving back up to the NE to a 1007 hPa low pressure center located near 35N/62W (**2**). This system has strong vorticity associated with it from low to mid levels, and is collocated with low environmental shear (**4**). The remnant convection from ex-TD05/PGI-29L continues to flare in southern LA, AL and the FL panhandle in a similar location to yesterday since the system hasn't changed position much. This system is being most carefully watched by the GRIP team for possible redevelopment a few days out if it re-emerges over the Gulf of Mexico. The global models continue to suggest that this system could redevelop along the Gulf coast and track westward in 48-72 hours (**10**).

There are currently three tropical waves in the basin (**1**). The first is located south of Cuba near Jamaica at 10N/80W extending back to 12N/70W. The second wave is located near the Windward Islands extending between 10N/62W and 22N/58W, and is associated with the *former* PGI-25L pouch. The third tropical wave is located in the central Atlantic extending North out of the ITCZ from 8N/33W to 20N/40W. A 1015 hPa surface high pressure center is located off of the west coast of FL suppressing convection in the Gulf. However, as the frontal boundary pushes south through Florida, the chances for showers and thunderstorms near Fort Lauderdale will increase throughout the weekend. In the eastern Atlantic, a large dry air outbreak with a lot of dust is oriented in a classic pattern and is suppressing convection in the area (**5, 6**). The dust can even be seen in visible

satellite imagery. Over Africa, PGI-28L remains fairly organized but the main vorticity associated with the system is moving northwest. The wave behind this, which has an associated pouch named PGI-30L (3), is forecasted by many models to emerge into the east Atlantic in a couple of days and undergo cyclogenesis (9).

### **Features of Interest:**

PGI-29L/Ex-TD05 is over Alabama (centered near 86.2W/32.3N) with less convection than yesterday. Some deep convection has developed over eastern Alabama and additional initiation is expected throughout the day. There is no evidence of low- or mid-level rotation in the satellite track winds; however, vorticity analyses indicate a low- and mid-level vorticity maxima centered over southern Alabama (10). Only a very weak surface trough is analyzed. A slow moving frontal boundary draped southwest-northeast east of the U.S. coast appears to be impacting the disturbance, initiating convection along the coast. Although the initial disturbance is weak, the model consensus is to maintain some mid-level vorticity that will move southward back towards the Gulf as an anticyclone builds over the central and eastern U.S. The model consensus forecast locations are as follows (10): 15/0000UTC: 85.3W/32.2N; 15/1200UTC: 84.8W/32.5N; 16/0000UTC: 84.7W/31.4N; 16/1200UTC: 85.4W/30.5N; 17/0000UTC: 86.9W/29.1N; 17/1200UTC: 88.7W/29.5N; 18/0000UTC: 90.1W/29.4N.

Ex-PGI-25L has some scattered convection; however, the wave is rather unimpressive. Although shear is low-to-moderate, the trough pushing into the Atlantic will begin to impact Ex-25L and is expected to be no longer of interest. An additional wave is centrally located south of Cuba at 80W. Convection is weak and northerly wind shear is ~20 kt. This wave is expected to move westward and is also not of interest for operations.

PGI-27L became well defined on 8/9 0000 UTC near 15W. It has been contending with dry air for the duration of its life. There has been no significant convection associated with the disturbance since 8/12 1200 UTC. The disturbance is associated with a trough visible in both the GFS analyses and the low-level CIMSS satellite derived winds. At 1200 UTC the trough extended from 12N/45W to 17N/48W. This is also visible as a maximum in the CIMSS 700 hPa vorticity analysis of  $2.5 \times 10^{-5} \text{ s}^{-1}$  16N/48W; the CIMSS vorticity analysis at 850 hPa is much more diffuse and weak with an intensity of  $1 \times 10^{-5} \text{ s}^{-1}$ . There is very dry air currently to the northwest of the system which is suppressing deep convection (5). The 700 hPa vorticity maxima associated with PGI27L is forecast to continue moving westward reaching 15N/55W by 8/15 1200 UTC, 15N/60W by 8/16 1200 UTC, and 15N/67W by 8/17 1200 UTC and then to continue moving westward into the Caribbean afterward while not developing and having an intensity of  $5 \times 10^{-5} \text{ s}^{-1}$  or weaker. The GFS is continuing to forecast increased convection as the disturbance and overall environment becomes slightly more moist but still very unfavorable for development over the next 72 hr. Further monitoring of the disturbance should continue as the environment may become more favorable once the disturbance moves into the Caribbean.

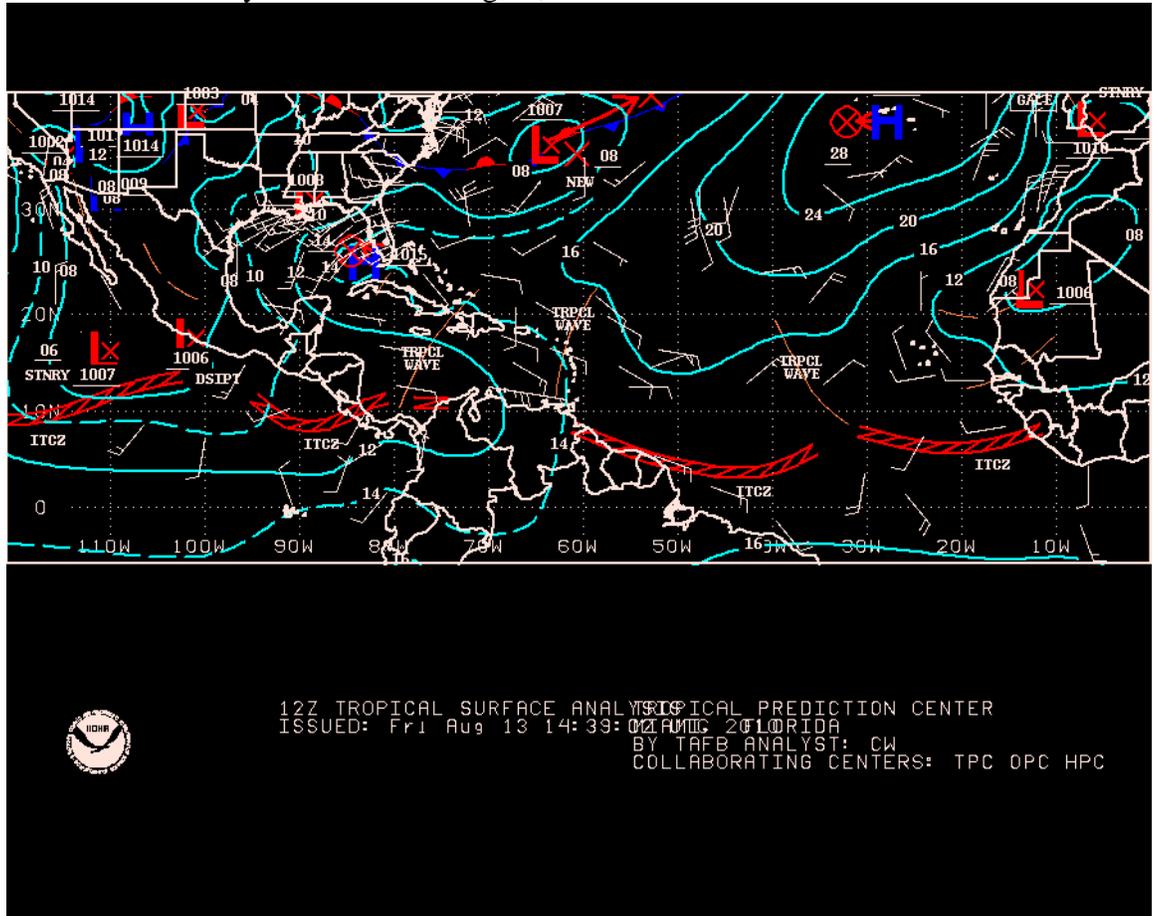
PGI-28L became well defined on 8/9 0000 UTC near 15E. Over the last 24 hr the westward motion of the system has slowed as it has approached a weakness in the East Atlantic mid-level ridge associated with an upper-tropospheric trough. The disturbance was analyzed in the CIMSS vorticity product at 8/9 1200 UTC as a large area of vorticity at 700 hPa located at 16N/13W with vorticity near  $1 \times 10^{-4} \text{ s}^{-1}$ . There is currently some deep convection associated with the disturbance (8). However, this has continued to weaken as the disturbance has encountered increasing dry air associated with subsidence in the mid-latitudes. This disturbance is forecast to continue moving northward reaching 23N/17W by 8/15 1200 UTC and 30N/16W by 8/16 1200 UTC. The disturbance will begin becoming highly sheared and deformed as it interacts with an upper-tropospheric trough over the East Atlantic.

As of 8/14 at 1200 UTC, a large dust plume has continued to move westward from the northwest African coast. This dust-laden airmass is the dominant meteorological feature in a ten degree by ten degree box centered on 25N/25W. (6) This dust outbreak is coincident with the movement of an upper level low from over Dakar, Senegal to a position over the Cape Verde islands, and the northwestward movement of an easterly wave (PGI-28L) behind the upper-level feature. Elsewhere in the East Atlantic, there is a small area of minor dust loading from 15N/50W to 10N/35W. The entire tropical Atlantic east of 50W is quite dry with TPW values less than 25 mm in most areas (5).

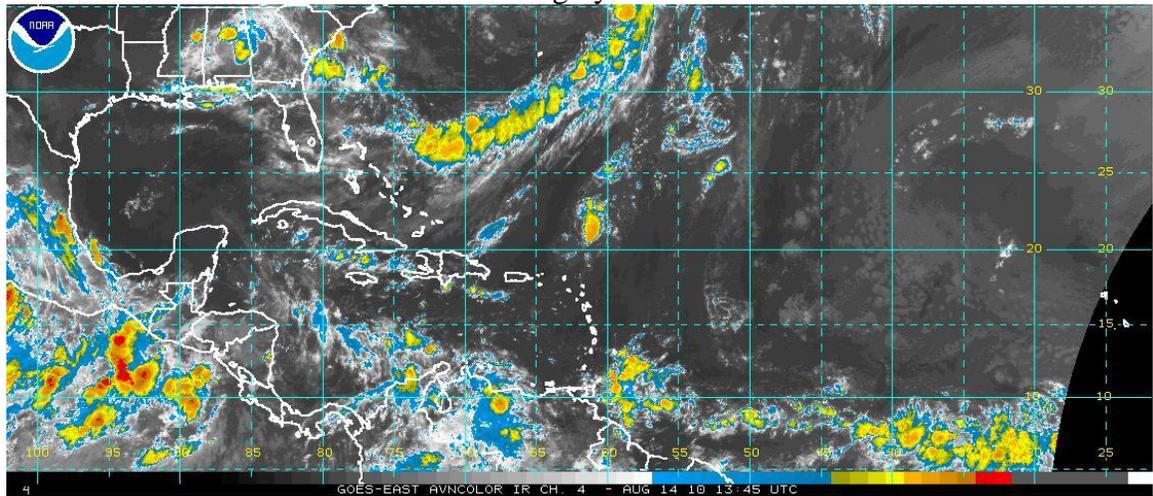
PGI-27L is located within the secondary dust feature mentioned above and is within a very dry environment. These conditions will likely continue to suppress convection within PGI-27L. PGI-28L is moving northwest from a currently moist environment into a drier environment as it exits the African coast (5). The predicted track of PGI-28L also takes it into the heavy dust laden region. Currently PGI-28L contains well-organized deep convection and dust microphysical properties will likely impact the evolution of the convection over the next 48 hours. The upper air soundings over Dakar, Senegal from the previous 48 hours showed a surge of moisture at the mid-levels as PGI-28L approached, with relative humidity values above 60% up to 500 hPa. (7) However geostationary IR imagery in the dust laden region shows some shallow convective activity there (6). This, along with CloudSat imagery (not shown) suggests that the dry dusty air is suppressing convection at mid-levels and above. This same behavior is likely to be seen in convection within PGI-28L as it moves over the Atlantic.

## **Static Images used in discussion:**

1) OPC Surface Analysis 1200 UTC Aug 14, 2010

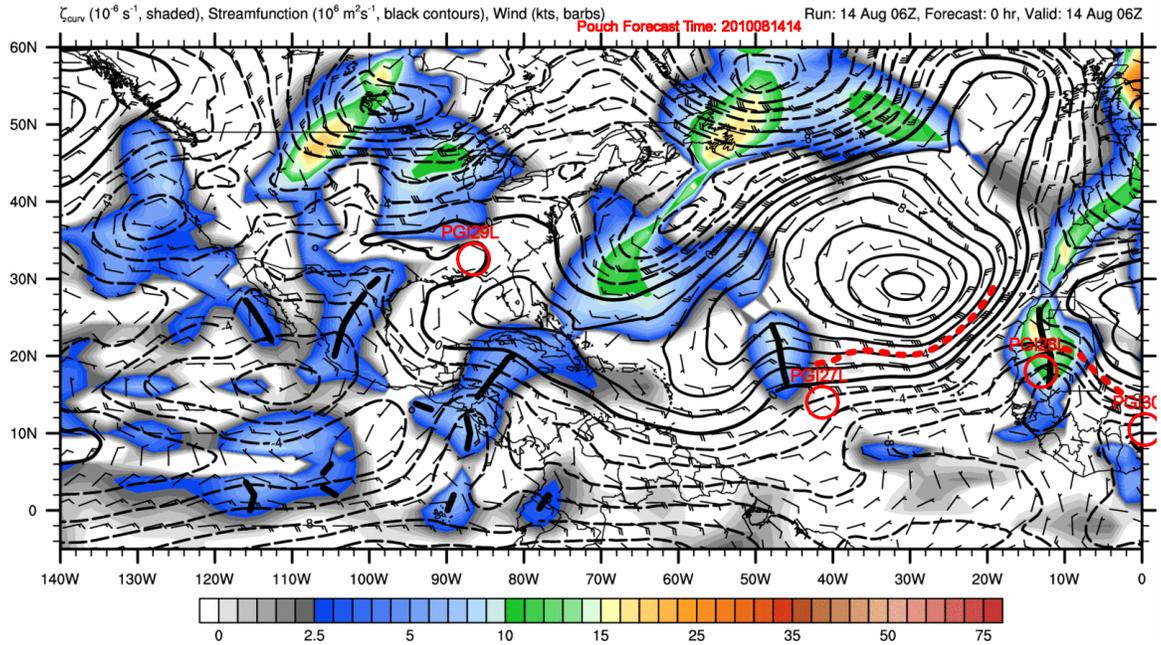


2) Atlantic Basin Wide View IR Satellite Imagery at 13:45 UTC

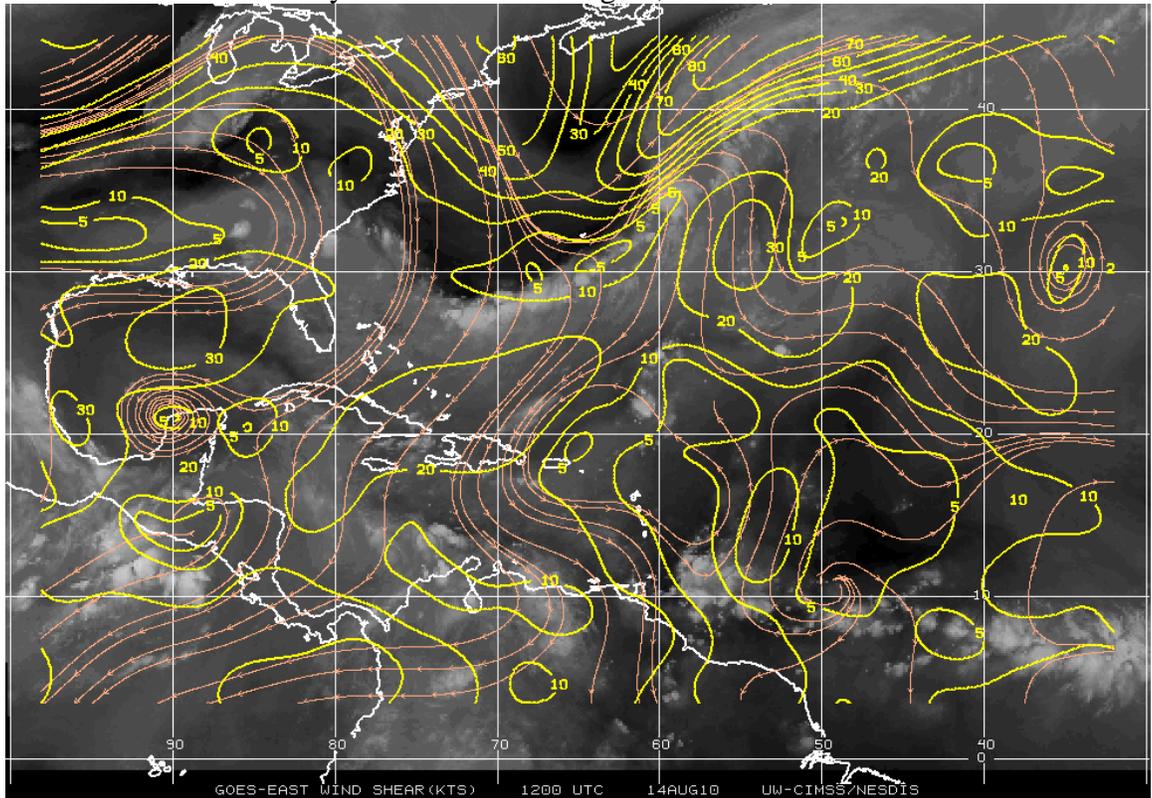


3) Montgomery Site Pouch Tracking 0000 UTC Aug 14, 2010. Locations of pouch identified on 700 hPa surface by Curvature vorticity, streamfunction, and winds.

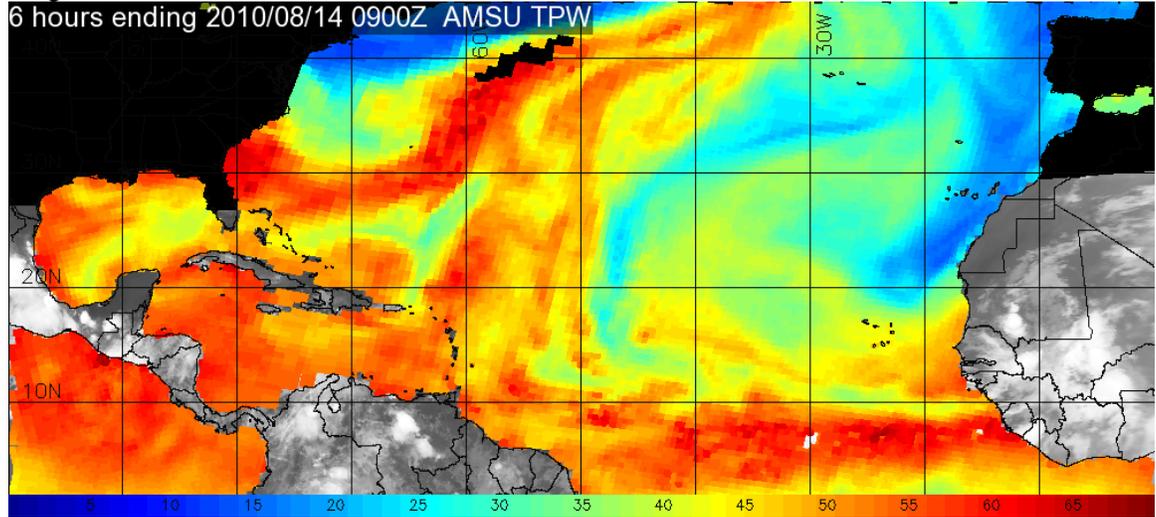
### 700 hPa Curvature Vorticity (Reduced to 2.5°), Streamfunction, and Wind



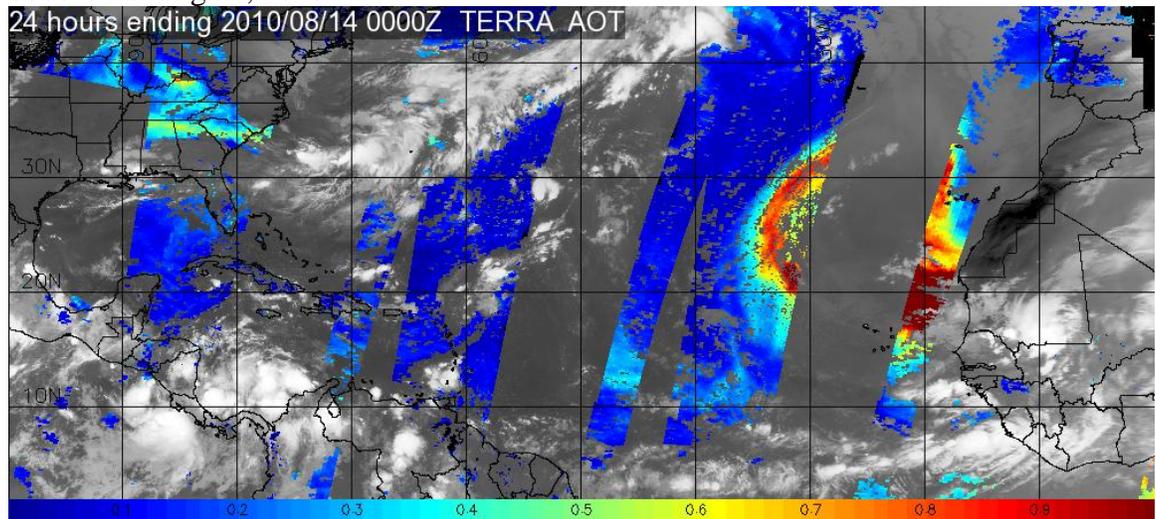
#### 4) CIMSS Wind Shear Analysis at 1200 UTC Aug 14, 2010



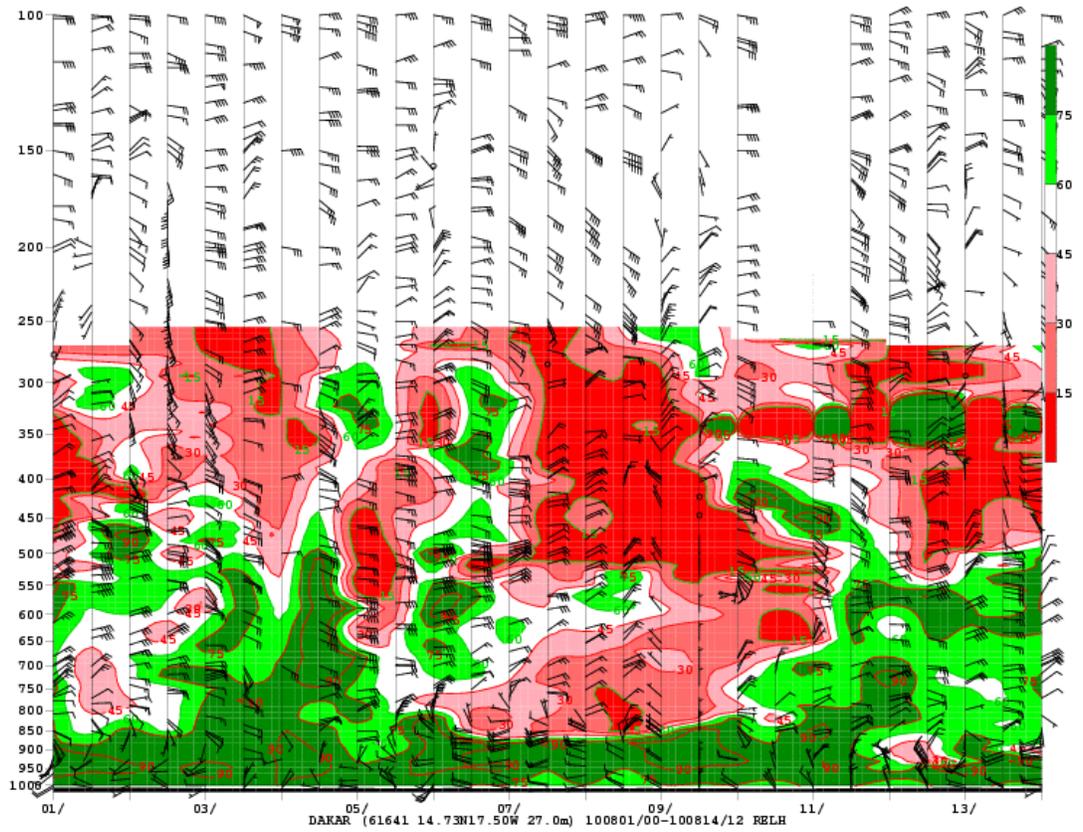
- 5) AMSU TPW 6-hr Composite Imagery from JPL "SGRIP" site ending 0900 UTC Aug 14, 2010



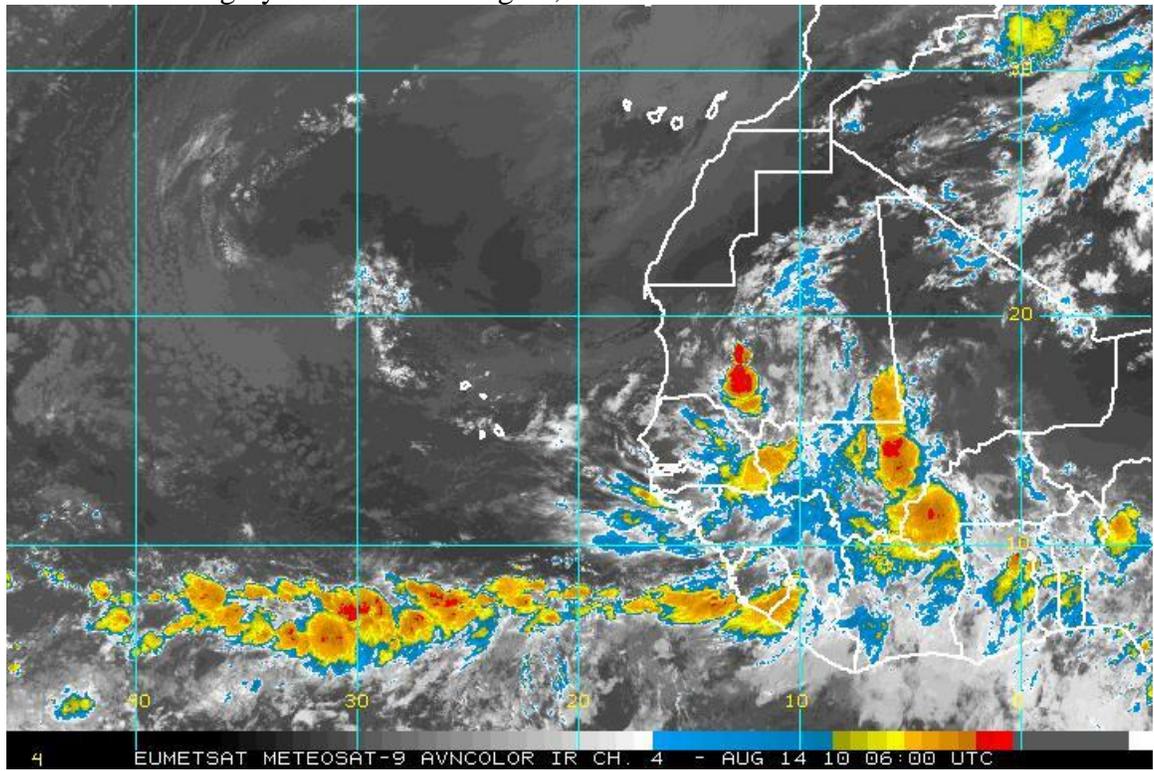
- 6) TERRA/AQUA AOT 24-hr composite imagery from JPL "SGRIP" site ending 0000 UTC Aug 14, 2010



### 7) Dakar, Senegal Upper Air Time Section Analysis of RH and Winds

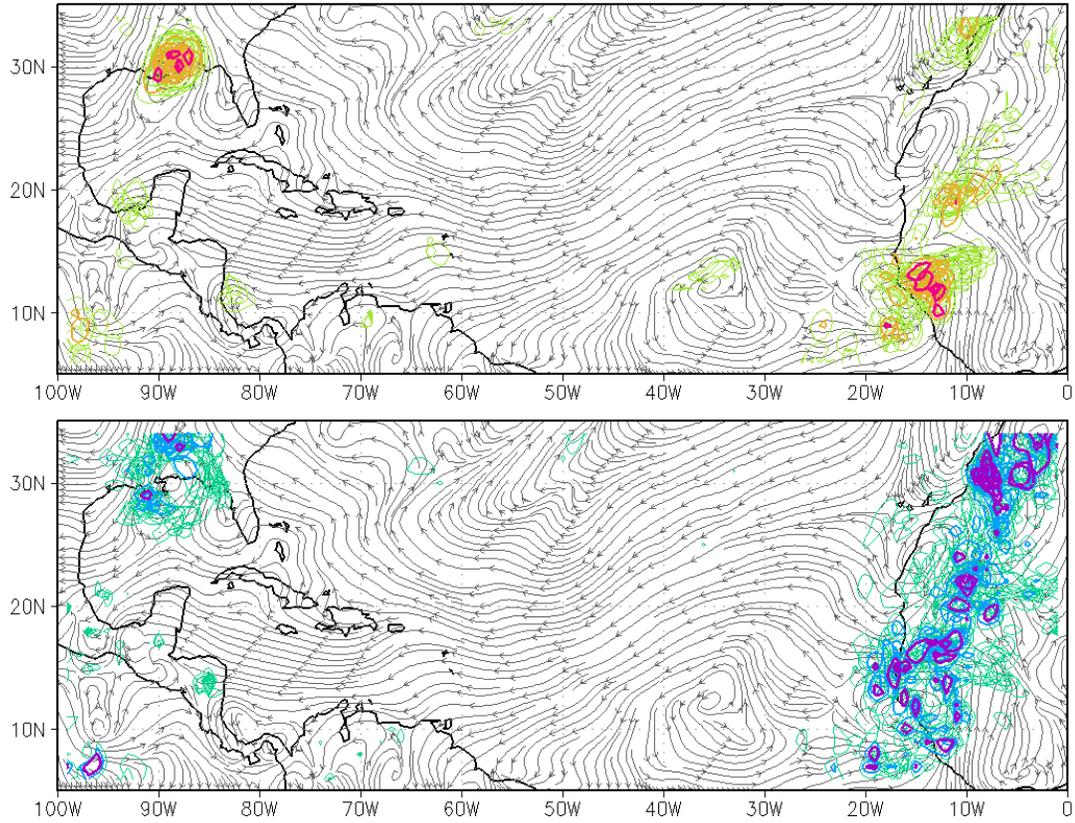


8) Meteosat IR Imagery at 0600 UTC Aug 14, 2010:



9) NCEP Ensemble Forecast at 72 hours from 0000 UTC initialization on Aug 14, 2010 at 850 hPa of Relative Vorticity (top) and Okubo-Weiss length (bottom), showing PGI-30L.

Gray: NCEP 72-hour CTRL streamlines at 850 hPa. Init. 2010081400, Valid 2010081700.  
Color: Spaghetti contours of ZETA x  $5e-5 \text{ s}^{-1}$  and OW x  $2e-9 \text{ s}^{-2}$ . 20 members.



- 10) Model Consensus Pouch Forecast for PGI-29L(initialized 0000 UTC Aug 14, 2010) overlain with Water Vapor Imagery and 850 hPa vorticity analysis from CIMSS (contours) at 13:45 UTC:

